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*Research Article*

# Prevalence Of Cubital Nerve Injury Among the People Working in Telecommunication Centres

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**ABSTRACT**

Background: Cubital Tunnel Syndrome (CuTS) occurs when the ulnar nerve is compressed in the cubital tunnel at the elbow, causing symptoms like weakness, tingling, and pain, particularly exacerbated by elbow flexion. Common in those with repetitive elbow use, like telecommunication workers, CuTS can significantly impair hand function and quality of life. It is crucial to see the prevalence of cubital tunnel syndrome in such individuals so we can modify the ergonomics accordingly.

**AIM:** To find the prevalence of cubital nerve injury among the people working in telecommunication centres.

**METHODOLOGY**: The sum of 98 individuals was taken, they were grouped according to their work experience. Then some clinical tests such as Tinel's sign, scratch collapse test, and elbow flexion were done to screen the condition. The individuals were taken according to inclusion and exclusion criteria. The study was conducted in Karad.

**RESULT:** This study assessed the prevalence of cubital tunnel syndrome (CuTS) among 98 telecommunications workers grouped by work experience (3–32 years) using Tinel's, scratch collapse, and elbow flexion tests. CuTS prevalence increased with work tenure, ranging from 12% in those with 3–9 years of experience to 56.5% in those with 25–32 years. Tinel's test showed the highest sensitivity across all groups. The findings highlight prolonged repetitive stress and ulnar nerve pressure as key risk factors, emphasizing the need for preventive ergonomic measures in high-risk occupations.

**CONCLUSION**: This study highlights the occupational risk of cubital tunnel syndrome (CuTS) among telecommunications workers, particularly those with longer job tenure. Repetitive movements and sustained elbow positions were identified as key contributors. A clear link was observed between increased work experience and higher positive test rates. The findings stress the need for ergonomic interventions, task rotation, and posture training to prevent CuTS. Early diagnosis using tests like Tinel's, elbow flexion, and scratch collapse is essential for timely management. Future research should explore larger populations and diverse settings to develop more effective prevention strategies.

**KEYWORDS**: Cubital tunnel syndrome, telecommunication workers, Ulnar nerve injury

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## INTRODUCTION

Cubital tunnel syndrome (CuTS), also known as ulnar nerve entrapment at the elbow, is a prevalent condition often linked to the anatomical structure and functional demands of the elbow joint. Prolonged or repetitive elbow flexion has been identified as a primary contributor to the irritation of the ulnar nerve, leading to the development of CuTS. Symptoms are exacerbated by frequent elbow flexion, further complicating the condition (Kelly & Hughes, 2013) [1].The medial epicondyle, a bony prominence at the elbow, is integral to the anatomy of the ulnar nerve. The nerve passes through the fibro-osseous cubital tunnel beneath the medial epicondyle, a region known as the "funny bone" due to its sensitivity.[2] Originating from the medial cord of the brachial plexus, the ulnar nerve traverses the arm, innervating muscles like the hypothenar group, third and fourth lumbricals, and adductor pollicis, while providing sensory input to the ulnar side of the fourth and fifth fingers. During elbow flexion, the nerve may stretch by 4.5 to 8 mm, increasing intraneural pressure and reducing the cubital tunnel's cross-

sectional area in up to 55% of cases (Schoen, 2002; Dimitriadis et al., 2013).[3]

CuTS is the second most prevalent nerve entrapment syndrome in the upper extremities, with an incidence of 20.9 to 30 per 100,000 individuals annually. The condition is most common in the fifth decade of life and frequently affects individuals in occupations requiring repetitive arm movements, such as dock workers and telephone operators (Anderson et al., 2022) [5]. CuTS symptoms often worsen at night or during prolonged elbow flexion. Common signs include tingling, numbness in the ring and little fingers, forearm pain, difficulty gripping, and hand clumsiness. In severe cases, muscle atrophy may cause finger clawing. While ulnar nerve compression can occur at various sites, the cubital tunnel is the most frequent. Early detection and management are crucial to preventing long-term complications, particularly in occupations with repetitive arm use, such as call center work (Bradley & Esformes, 2014).[4]The modern telecommunications industry is characterized by high productivity demands and prolonged use of phones and headsets. These repetitive actions and static postures increase the risk of CuTS among workers. Sustained elbow flexion while holding phones or headsets can compress the ulnar nerve against the underlying structures of the cubital tunnel. Tasks requiring forceful grasping or prolonged bending of the elbow further exacerbate this risk (Gould, 2006) [6]

If untreated, CuTS can lead to severe consequences, including chronic pain, disturbed sleep patterns, and permanent muscle atrophy in the hand. These impairments can hinder fine motor skills required for tasks like typing or phone handling, thereby reducing productivity and quality of life (Hilgersom et al., 2019) [7].Accurate diagnosis involves a comprehensive assessment, including physical examination, medical history, and specialized diagnostic tests. Electromyography (EMG) and nerve conduction studies (NCS) are commonly used to evaluate nerve function and pinpoint compression sites. Imaging techniques such as MRI and ultrasound can further delineate anatomical structures and identify areas of compression (Urits et al., 2020) [8].Treatment strategies for CuTS range from conservative to surgical approaches, depending on symptom severity and underlying pathology. Conservative management includes physical therapy, ergonomic adjustments, anti-inflammatory medications, and splinting to reduce nerve compression. In refractory cases, surgical intervention such as ulnar nerve decompression or transposition may be required to restore function (Kiesel & Rhodes, 2017) [9]

**MATERIALS**: -

a) Consent Form

**INCLUSION: -**

1. Gender: Both Males and Females
2. Age: 35-55
3. Patients with work experience of more than 2 years

**EXCLUSION: -**

1. People with other comorbidities
2. People who are not willing to participate

**OUTCOME MEASURE: -**

Special tests: Elbow flexion test
Tinel sign
Scratch collapse test

**METHODOLOGY**

a.Study type: Observational Study
b. Study design: Survey study
c.Place of study: Karad
d. Period of study: 3 months
e.Sampling Technique: Consecutive sampling
f. Sample size: As per the reference article it was observed that the prevalence of cubital tunnel syndrome was 6.9%
g. Study population: Both Male and Female

Where n = sample size
$n = Z2\ pq/L2 = 98$
Z = standard normal variant at 95%=1.96
P = 0.8%
q = 100 – 6.9 = 93.1
L = 5 (permissible limit of error)
n = 98
Taking prevalence p=0.8%

**PROCEDURE**

This will be a study of the prevalence of cubital tunnel syndrome in telecommunication workers. Certification will be taken from the protocol committee. Then permission will be taken from authorities and the ethical committee. Patients will be selected according to inclusion and exclusion criteria. Informed consent will be taken, and data will be collected. Certain special tests will be performed and based on collected data statistical analysis will be done.

**DATA PRESENTATION, ANALYSIS RESULT AND INTERPRETATION**

A total of 98 telecommunications workers were included in the study to evaluate the prevalence of cubital tunnel syndrome based on their years of work experience. Participants were divided into 4 groups according to their years of experience: 3-9 years, 10- 16 years, 17-24 years, 24-32 years. The prevalence of cubital tunnel syndrome was assessed using the clinical test: tinel test, scratch collapse test, and elbow flexion test.

Out of 98 participants, 8 participants were shown a positive sign of elbow flexion test, 8 participants had a positive sign for scratch collapse test and only 1 participant showed a positive sign for Tinel sign.

**Table 1**

| Gender | No. of participants | Percentage (%) |
|---|---|---|
| Male | 86 | 87.75 |
| Female | 12 | 12.24 |

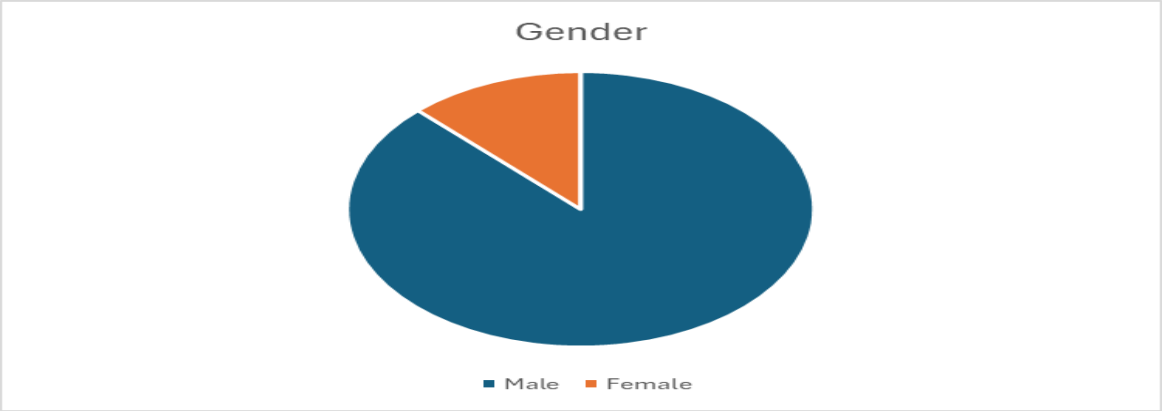


**Table 2**

| Age | No. of participants | Percentage (%) |
|---|---|---|
| 35-40 | 60 | 61.22 |
| 40-45 | 23 | 23.46 |
| 45-50 | 8 | 8.16 |
| 50-55 | 7 | 7.14 |

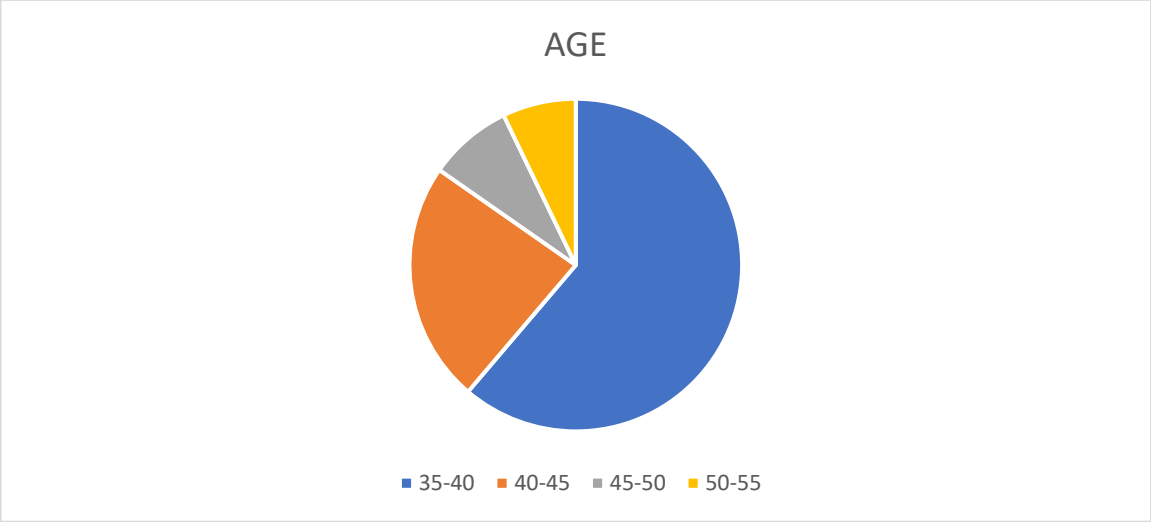


**Table 3(Grouping by Years of Work Experience)**

| Group | Total in group | Tinel's sign (positive %) | Scratch collapse test (positive %) | Elbow Flexion test (positive) |
|---|---|---|---|---|
| 3 - 9 | 25 | 3(12%) | 1(4%) | 2(8%) |
| 10- 16 | 25 | 5(20%) | 3(12%) | 5(20%) |
| 17 - 24 | 25 | 7(28%) | 5(20%) | 7(28%) |
| 25-32 | 23 | 13(56.5%) | 9(39.1%) | 10(43.4%) |

As the number of working years increases, the prevalence of cubital tunnel syndrome also increases, as shown by higher positive test results in groups with longer working years.
Tinel's test shows the highest sensitivity across all groups, followed by the elbow flexion test and the scratch collapse test, reflecting the progression of the condition with repetitive strain.

**Group 1** (3-9 years of work experience): In this group, 12% of the participants tested positive for cubital tunnel syndrome. Specifically:
Tinel's Test: 3 out of 25 participants (12%) tested positive.
Scratch Collapse Test: 1 out of 25 participants (4%) tested positive.
Elbow Flexion Test: 2 out of 25 participants (8%) tested positive.
These results suggest that cubital tunnel syndrome is relatively uncommon in individuals with fewer than 5 years of work experience, likely due to a lower accumulation of repetitive stress injuries.

**Group 2** (10-16 years of work experience): In this group, 20% of participants exhibited signs of cubital tunnel syndrome:
Tinel's Test: 5 out of 25 participants (20%) tested positive.

Scratch Collapse Test: 3 out of 25 participants (12%) tested positive.
Elbow Flexion Test: 5 out of 25 participants (20%) tested positive.
The higher positive test rate in this group may indicate the early onset of cubital tunnel syndrome, as workers begin to experience repetitive stress injuries due to their occupational demands.

**Group 3** (17-24 years of work experience): Of participants in this group, 35% showed signs of cubital tunnel syndrome:
Tinel's Test: 7 out of 25 participants (28%) tested positive.
Scratch Collapse Test: 5 out of 20 participants (30%) tested positive.
Elbow Flexion Test: 7 out of 25 participants (28%) tested positive.
The increase in positive results indicates that the cumulative effect of prolonged repetitive tasks, particularly those involving elbow flexion and wrist movements, contributes significantly to the onset and progression of cubital tunnel syndrome.

**Group 4** (25-32): In this group, 56.5% of participants tested positive for cubital tunnel syndrome, reflecting the highest prevalence across all groups:
Tinel's Test: 7 out of 23 participants (56.5%) tested positive.
Scratch Collapse Test: 9 out of 23 participants (39.1%) tested positive.
Elbow Flexion Test: 10 out of 23 participants (43.4%) tested positive.
These results highlight that workers with over 16 years of experience are at significantly higher risk for cubital tunnel syndrome due to the prolonged nature of their repetitive activities and sustained pressure on the ulnar nerve.

## DISCUSSION

Cubital Tunnel Syndrome (CuTS), resulting from ulnar nerve compression at the elbow, remains a notable occupational hazard, particularly in professions involving repetitive or sustained elbow flexion. This study aimed to investigate the prevalence of CuTS among telecommunication workers, a group inherently exposed to prolonged periods of repetitive upper limb activity. The findings suggest a relatively low prevalence of CuTS in this cohort, with positive results most pronounced in the group with the longest work experience (25–32 years). This aligns with the established understanding that cumulative repetitive stress increases the risk of nerve entrapment. Males exhibited a higher prevalence than females, possibly reflecting gender-based differences in occupational roles or ergonomic practices. The results resonate with findings by Kuijjer and Van der Pas, who reported ulnar neuropathy linked to prolonged laptop use in flexible office environments. Their case study highlighted the ergonomic risks posed by sustained pressure on the elbow, underscoring the importance of workplace design in mitigating CuTS risk. Similarly, Saleh and Zahran's study on mobile hand-held device users revealed significant variations in ulnar nerve conduction velocities across different elbow flexion angles, emphasizing the role of elbow positioning in nerve health. This study also underscores the importance of ergonomic awareness in mitigating occupational CuTS. The relatively low prevalence observed may reflect effective ergonomic interventions, such as adjustable workstations and training on proper posture and task rotation. However, the findings highlight that even with such measures, prolonged exposure remains a risk factor, particularly for those with extensive job tenure. The use of diagnostic tests such as Tinel's sign, scratch collapse test, and elbow flexion test provided reliable screening tools, with varying sensitivity across groups. These findings suggest that combining multiple diagnostic approaches enhances the early detection of CuTS, enabling timely intervention. Given the evolving demands of the telecommunication industry, future studies should explore the long-term impact of workplace ergonomics on nerve health, incorporating larger and more diverse sample populations. Investigating the interplay between emerging technologies and worker health will also be crucial to developing adaptive interventions that promote both productivity and well-being.

## CONCLUSION

This study highlights the potential occupational risks of Cubital Tunnel Syndrome (CuTS) among telecommunication workers, particularly those with extended job tenure. The findings suggest that repetitive movements and sustained elbow positions inherent in telecommunication tasks contribute to the development of this condition. Although the overall prevalence of CuTS was relatively low, a clear correlation between longer work experience and increased positive test results was observed. The study emphasizes the importance of ergonomic interventions and preventive strategies, such as proper workstation design, task rotation, and employee training on posture and body mechanics. Early identification through reliable diagnostic tests like Tinel's sign, elbow flexion test, and scratch collapse test is crucial for timely management, reducing the risk of long-term complications. To enhance workplace safety and worker health, future research should focus on larger populations, diverse occupational settings, and the long-term impact of ergonomic modifications. This will contribute to more effective strategies to prevent CuTS and improve the quality of life for telecommunication workers.

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